

SEQUENCE LISTING

<110> Garcia-Calvo, Margarita

<120> NPC1L1 (NPC3) AND METHODS OF IDENTIFYING LIGANDS THEREOF

<130> 36134-PCT 074669.0111

<140> To Be Assigned

<141> 2005-01-14

<150> US 60/537,341

<151> 2004-01-16

<160> 51

<170> PatentIn version 3.1

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<211> 3996

<212> DNA

<213> Rattus sp.

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Ala Ala Gln Gly Glu Leu Tyr Thr Pro Lys His Glu Ala Gly Val Cys
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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu

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gtc acg ggt gaa cac ctg gct ctt ctc cag cgcc atc tgt ccc cgcc ctg			240
Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu			
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Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu			
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ctg tcc tta gaa agc agc atg tcc atc acc aag gcc ctt ctc acg cgcc			336
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Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr			
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Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu			
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Arg Gly Ala Gly Glu Pro Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr			
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg			
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Ile Pro Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr			
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu			
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Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile			
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Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys			
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Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Glu Ala Leu			
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Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile		
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Arg Asn		
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Ser Gly Ile Leu Ser Leu Asp Phe Leu Leu Glu Leu Leu Glu Leu Gln		
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Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Glu Arg Asn		
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr		
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Ser Leu Ser Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn		
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Asn Arg Thr Leu Leu Met Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln		
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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln		
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625 630 635 640		
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Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly		
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Val Ile Val Val Leu Gly Ala Val Leu Ala Ala Met Gly Phe Tyr Ser		
675 680 685		
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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe		
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Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu		
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Phe His Lys Tyr Leu Pro Trp	Phe Leu Asn Asp Pro	Pro Asn Ile	
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Arg Cys Pro Lys Gly Gly Leu	Ala Ala Tyr Arg Thr	Ser Val Asn	
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His Lys Pro Leu Arg Asn Ser	Gln Asp Phe Thr Glu	Ala Leu Arg	
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Gln	Leu	Ile	Gln	Ile	Phe	Phe	Phe	Arg	Leu	Asn	Leu	Leu	Ile	Thr	
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Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile
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Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser
370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Arg Asn
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420 425 430

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Ser Leu Ser Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn
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Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Zala

515

520

525

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Asp Lys Phe Gln Val Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu
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Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly
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740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
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Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe
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Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys
785 790 795 800

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805 810 815

Lys Leu Pro Pro Pro Lys Glu Lys Gly Leu Leu Leu Arg Phe Phe
820 825 830

Arg Lys Ile Tyr Ala Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val
835 840 845

Val Met Leu Leu Phe Leu Thr Leu Phe Gly Ala Asn Leu Tyr Leu Met
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val
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Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile
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Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly
1100 1105 1110

Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys
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Tyr Leu Leu Leu Gly Leu Asp Met Cys Ser Gly Ile Leu Asn Leu
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Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val
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Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg
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Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys
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Asp Ala Thr Val Phe Met Gly Ser Ala Val Phe Ala Gly Val Ala
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Met Thr Asn Phe Pro Gly Ile Leu Ile Leu Gly Phe Ala Gln Ala
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Gln Leu Ile Gln Ile Phe Phe Arg Leu Asn Leu Leu Ile Thr
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Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Gln Glu Glu
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Lys Leu Ala Ser Glu Ala Ala Val Ala Pro Glu Pro Ser Cys Pro
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Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly
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Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr	
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tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc	144
Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser	
35 40 45	
ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc	192
Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg	
50 55 60	
aag atc aca ggt gat cac ctg atc cta tta cag aag atc tgc ccc cgc	240
Lys Ile Thr Gly Asp His Leu Ile Leu Gln Lys Ile Cys Pro Arg	
65 70 75 80	
ctc tac acc ggc ccc aac acc caa gcc tgc tgc tcc gcc aag cag ctg	288
Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu	
85 90 95	
gta tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc	336
Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg	
100 105 110	
tgc cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc cac aac acg	384
Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr	
115 120 125	
tgc agc ccc aat cag agc ctc ttc atc aat gtg acc cgc gtg gcc cag	432
Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln	
130 135 140	
cta ggg gct gga caa ctc cca gct gtg gtg gcc tat gag gcc ttc tac	480
Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr	
145 150 155 160	
cag cat agc ttt gcc gag cag agc tat gac tcc tgc agc cgt gtg cgc	528
Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg	
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gtc cct gca gct gcc acg ctg gct gtg ggc acc atg tgt ggc gtg tat	576
Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr	
180 185 190	
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp	
195 200 205	
aca ggc aat ggt ctg gcc cca ctg gac atc acc ttc cac ctc ttg gag	672
Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu	
210 215 220	
cct ggc cag gcc gtg ggg agt ggg att cag cct ctg aat gag ggg gtt	720
Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val	
225 230 235 240	
gca cgt tgc aat gag tcc caa ggt gac gac gtg gcg acc tgc tcc tgc	768
Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys	
245 250 255	

caa gac tgt gct gca tcc tgt cct gcc ata gcc cgc ccc cag gcc ctc Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu 260 265 270	816
gac tcc acc ttc tac ctg ggc cag atg ccg ggc agt ctg gtc ctc atc Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile 275 280 285	864
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ttc cgt gtg gcc ccc gcc agg gac aaa agc aag atg gtg gac ccc aag Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys 305 310 315 320	960
aag ggc acc agc ctc tct gac aag ctc agc ttc tcc acc cac acc ctc Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu 325 330 335	1008
ctt ggc cag ttc cag ggc tgg ggc acg tgg gtg gct tcg tgg cct Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro 340 345 350	1056
ctg acc atc ttg gtg cta tct gtc atc ccg gtg gtg gcc ttg gca gcg Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala 355 360 365	1104
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gcc ccc aac agc caa gcc cgg agt gag aaa gct ttc cat gac cag cat Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His 385 390 395 400	1200
ttc ggc ccc ttc ttc cga acc aac cag gtg atc ctg acg gct cct aac Phe Gly Pro Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn 405 410 415	1248
cgg tcc agc tac agg tat gac tct ctg ctg ggg ccc aag aac ttc Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe 420 425 430	1296
agc gga atc ctg gac ctg gac ttg ctg ctg gag ctg cta gag ctg cag Ser Gly Ile Leu Asp Leu Asp Leu Leu Glu Leu Glu Leu Gln 435 440 445	1344
gag agg ctg cgg cac ctc cag gta tgg tcg ccc gaa gca cag cgc aac Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn 450 455 460	1392
atc tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr 465 470 475 480	1440
agt ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn	1488

485	490	495	
aac cgc acg ctc ctg ctg ctc aca gcc aac cag aca ctg atg ggg cag Asn Arg Thr Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln 500	505	510	1536
acc tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515	520	525	1584
ccg ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala 530	535	540	1632
gac tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys 545	550	555	1680
gga aag gac tat tct gag gca gag gcc ctg atc atg acg ttc tcc ctc Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu 565	570	575	1728
aac aat tac cct gcc ggg gac ccc cgt ctg gcc cag gcc aag ctg tgg Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp 580	585	590	1776
gag gag gcc ttc tta gag gaa atg cga gcc ttc cag cgt cgg atg gct Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala 595	600	605	1824
ggc atg ttc cag gtc acg ttc acg gct gag cgc tct ctg gaa gac gag Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu 610	615	620	1872
atc aat cgc acc aca gct gaa gac ctg ccc atc ttt gcc acc agc tac Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr 625	630	635	1920
att gtc ata ttc ctg tac atc tct ctg gcc ctg ggc agc tat tcc agc Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser 645	650	655	1968
tgg agc cga gtg atg gtg gac tcc aag gcc acg ctg ggc ctc ggc ggg Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly 660	665	670	2016
gtg gcc gtg gtc ctg gga gca gtc atg gct gcc atg ggc ttc ttc tcc Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser 675	680	685	2064
tac ttg ggt atc cgc tcc tcc ctg gtc atc ctg caa gtg gtt cct ttc Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe 690	695	700	2112
ctg gtg ctg tcc gtg ggg gct gat aac atc ttc atc ttt gtt ctc gag Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu 705	710	715	2160
tac cag agg ctg ccc cg agg cct ggg gag cca cga gag gtc cac att			2208

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile			
725	730	735	
ggg cga gcc cta ggc agg gtg gct ccc agc atg ctg ttg tgc agc ctc			2256
Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu			
740	745	750	
tct gag gcc atc tgc ttc cta ggg gcc ctg acc ccc atg cca gct			2304
Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala			
755	760	765	
gtg cgg acc ttt gcc ctg acc tct ggc ctt gca gtg atc ctt gac ttc			2352
Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe			
770	775	780	
ctc ctg cag atg tca gcc ttt gtg gcc ctg ctc tcc ctg gac agc aag			2400
Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys			
785	790	795	800
agg cag gag gcc tcc cgg ttg gac gtc tgc tgc tgt gtc aag ccc cag			2448
Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Val Lys Pro Gln			
805	810	815	
gag ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc			2496
Glu Leu Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe			
820	825	830	
caa aag gct tat gcc ccc ttc ctg ctg cac tgg atc act cga ggt gtt			2544
Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val			
835	840	845	
gtg ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg			2592
Val Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met			
850	855	860	
tgc cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac			2640
Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp			
865	870	875	880
tcg tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg			2688
Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val			
885	890	895	
ggg gcc ccg gtg tac ttt gtt acc acc ttg ggc tac aac ttc tcc agc			2736
Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser			
900	905	910	
gag gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc			2784
Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe			
915	920	925	
tcc ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct			2832
Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser			
930	935	940	
tac ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg			2880
Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp			
945	950	955	960

ctg acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag	2928
Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys	
965 970 975	
gac aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac	2976
Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn	
980 985 990	
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Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe	
995 1000 1005	
cat aag tat ctt ccc tgg ttc ctg aac gac cg _g ccc aac atc aaa	3069
His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys	
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Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu	
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Thr Ser Asp Gly Gln Val Leu Ala Ser Arg Phe Met Ala Tyr His	
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Lys Pro Leu Lys Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala	
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Ala Arg Glu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val	
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Pro Gly Thr Asp Pro Ala Phe Glu Val Phe Pro Tyr Thr Ile Thr	
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Asn Val Phe Tyr Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu	
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Phe Met Leu Ser Leu Cys Leu Val Pro Thr Phe Ala Val Ser Cys	
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Leu Leu Leu Gly Leu Asp Leu Arg Ser Gly Leu Leu Asn Leu Leu	
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Ser Ile Val Met Ile Leu Val Asp Thr Val Gly Phe Met Ala Leu	
1145 1150 1155	
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Trp Asp Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val Ser	
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Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg Ser	
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Phe	Ala	Ile	Ser	Thr	Lys	Pro	Thr	Trp	Leu	Glu	Arg	Ala	Lys	Glu	
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gcc	acc	atc	tct	atg	gga	agt	gcg	gtg	ttt	gca	ggt	gtg	gcc	atg	3654
Ala	Thr	Ile	Ser	Met	Gly	Ser	Ala	Val	Phe	Ala	Gly	Val	Ala	Met	
1205						1210					1215				
acc	aac	ctg	cct	ggc	atc	ctt	gtc	ctg	ggc	ctc	gcc	aag	gcc	cag	3699
Thr	Asn	Leu	Pro	Gly	Ile	Leu	Val	Leu	Gly	Leu	Ala	Lys	Ala	Gln	
1220						1225					1230				
ctc	att	cag	atc	ttc	ttc	ttc	cgc	ctc	aac	ctc	ctg	atc	act	ctg	3744
Leu	Ile	Gln	Ile	Phe	Phe	Phe	Arg	Leu	Asn	Leu	Leu	Ile	Thr	Leu	
1235						1240					1245				
ctg	ggc	ctg	ctg	cat	ggc	ttg	gtc	ttc	ctg	ccc	gtc	atc	ctc	agc	3789
Leu	Gly	Leu	Leu	His	Gly	Leu	Val	Phe	Leu	Pro	Val	Ile	Leu	Ser	
1250						1255					1260				
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Tyr	Val	Gly	Pro	Asp	Val	Asn	Pro	Ala	Leu	Ala	Leu	Glu	Gln	Lys	
1265						1270					1275				
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Arg	Ala	Glu	Glu	Ala	Val	Ala	Ala	Val	Met	Val	Ala	Ser	Cys	Pro	
1280						1285					1290				
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Asn	His	Pro	Ser	Arg	Val	Ser	Thr	Ala	Asp	Asn	Ile	Tyr	Val	Asn	
1295						1300					1305				
cac	agc	ttt	gaa	ggt	tct	atc	aaa	ggt	gct	ggt	gcc	atc	agc	aac	3969
His	Ser	Phe	Glu	Gly	Ser	Ile	Lys	Gly	Ala	Gly	Ala	Ile	Ser	Asn	
1310						1315					1320				
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20

25

30

Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser
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Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg
50 55 60

Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg
65 70 75 80

Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu
85 90 95

Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg
100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr
115 120 125

Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln
130 135 140

Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr
145 150 155 160

Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg
165 170 175

Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr
180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
210 215 220

Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val
225 230 235 240

Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu
260 265 270

Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile
275 280 285

Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly
290 295 300

Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu
325 330 335

Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro
340 345 350

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355 360 365

Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser
370 375 380

Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His
385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn
405 410 415

Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe
420 425 430

Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln
435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn
450 455 460

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr
465 470 475 480

Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn
485 490 495

Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln
500 505 510

Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala
515 520 525

Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala
530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys
545 550 555 560

Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu
565 570 575

Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp
580 585 590

Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala
595 600 605

Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu
610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr
625 630 635 640

Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser
645 650 655

Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe
690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu
705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile
725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe
770 775 780

Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys
785 790 795 800

Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln
805 810 815

Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe
820 825 830

Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val
835 840 845

Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met
850 855 860

Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp
865 870 875 880

Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val
885 890 895

Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser
900 905 910

Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe
915 920 925

Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser
930 935 940

Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp
945 950 955 960

Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys

965

970

975

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Ala Arg Glu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val
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Pro Gly Thr Asp Pro Ala Phe Glu Val Phe Pro Tyr Thr Ile Thr
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Asn Val Phe Tyr Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu
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Arg Ala Glu Glu Ala Val Ala Ala Val Met Val Ala Ser Cys Pro
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<212> DNA

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<213> Rattus sp.

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tcg gcc cag ggt gag ctc tac aca ccc act cac aaa gct ggc tttc tgc			96
Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys			
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acc ttt tat gaa gag tgt ggg aag aac cca gag ctt tct gga ggc ctc			144
Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu			
35 40 45			
aca tca cta tcc aat atc tcc tgc ttg tct aat acc cca gcc cgc cat			192
Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His			
50 55 60			
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Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu			
65 70 75 80			
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Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu			
85 90 95			
gtg tca tta gac agt agc ctg tct atc acc aag gcc ctc ctt a ca cgc			336
Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg			
100 105 110			
tgc ccg gca tgc tct gaa aat ttt gtg agc ata cac tgt cat a at acc			384
Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr			
115 120 125			
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Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln			
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Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr			
145 150 155 160			
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg			
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cct ggc cag gcc ctg gca gat ggg atg aag cca ctg gat ggg aag atc Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile 225 230 235 240	720
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acc tcc ctg gtg gac tgg aag gac cat ttc ctc tac tgt gcc aat gcc Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525	1584
cct ctc acg tac aaa gat ggc aca gcc ctg gcc ctg agc tgc ata gct Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala 530 535 540	1632
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Ser	Tyr	Leu	Ile	Asp	Tyr	Phe	Leu	Phe	Leu	Asn	Arg	Tyr	Leu	Glu	Val	
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ggg	cct	cca	gtg	tac	ttt	gac	acc	acc	tca	ggc	tac	aac	ttt	tcc	acc	2736
Gly	Pro	Pro	Val	Tyr	Phe	Asp	Thr	Thr	Ser	Gly	Tyr	Asn	Phe	Ser	Thr	
900						905								910		
gag	gca	ggc	atg	aac	gcc	att	tgc	tct	agt	gca	ggc	tgt	gag	agc	ttc	2784
Glu	Ala	Gly	Met	Asn	Ala	Ile	Cys	Ser	Ser	Ala	Gly	Cys	Glu	Ser	Phe	
915						920								925		
tcc	cta	acc	cag	aaa	atc	cag	tat	gcc	agt	gaa	ttc	cct	aat	cag	tct	2832
Ser	Leu	Thr	Gln	Lys	Ile	Gln	Tyr	Ala	Ser	Glu	Phe	Pro	Asn	Gln	Ser	
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tat	gtg	gct	att	gct	gca	tcc	tcc	tgg	gta	gat	gac	ttc	atc	gac	tgg	2880
Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp	
945						950								960		
ctg	acc	cca	tcc	tcc	tcc	tgc	tgc	att	tat	acc	cgt	ggc	ccc	cat		2928
Leu	Thr	Pro	Ser	Ser	Ser	Cys	Cys	Arg	Ile	Tyr	Thr	Arg	Gly	Pro	His	
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aaa	gat	gag	ttc	tgt	ccc	tca	acg	gat	act	tcc	ttc	aac	tgt	ctc	aaa	2976
Lys	Asp	Glu	Phe	Cys	Pro	Ser	Thr	Asp	Thr	Ser	Phe	Asn	Cys	Leu	Lys	
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aac	tgc	atg	aac	cgc	act	ctg	ggt	ccc	gtg	aga	ccc	aca	aca	gaa	cag	3024
Asn	Cys	Met	Asn	Arg	Thr	Leu	Gly	Pro	Val	Arg	Pro	Thr	Thr	Glu	Gln	
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Phe	His	Lys	Tyr	Leu	Pro	Trp	Phe	Leu	Asn	Asp	Thr	Pro	Asn	Ile		
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Leu	Ser	Ser	Asp	Gly	Gln	Ile	Ile	Ala	Ser	Gln	Phe	Met	Ala	Tyr		
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His	Lys	Pro	Leu	Arg	Asn	Ser	Gln	Asp	Phe	Thr	Glu	Ala	Leu	Arg		
1055						1060								1065		
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Ala	Ser	Arg	Leu	Leu	Ala	Ala	Asn	Ile	Thr	Ala	Glu	Leu	Arg	Lys		
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Val	Pro	Gly	Thr	Asp	Pro	Asn	Phe	Glu	Val	Phe	Pro	Tyr	Thr	Ile		
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Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu
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Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu
85 90 95

Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg
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Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln
130 135 140

Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg
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Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr

180

185

190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
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Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile
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Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Ala Leu
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Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile
275 280 285

Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Val Val Leu Val Tyr
290 295 300

Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln
305 310 315 320

Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val
325 330 335

Leu Gly Arg Phe Phe Glu Ser Trp Gly Thr Arg Val Ala Ser Trp Pro
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Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser
370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ala Phe His Asp Glu His
385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Lys Asn
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Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe
420 425 430

Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln
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Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr
465 470 475 480

Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn
485 490 495

Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln
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Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala
515 520 525

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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln
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Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile
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Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala
595 600 605

Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu
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Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr
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Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
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Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser
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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe
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725 730 735

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740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala
755 760 765

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770 775 780

Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys
785 790 795 800

Arg Gln Glu Ala Ser Arg Pro Asp Val Val Cys Cys Phe Ser Ser Arg
805 810 815

Asn Leu Pro Pro Pro Lys Gln Lys Glu Gly Leu Leu Leu Cys Phe Phe
820 825 830

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835 840 845

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850 855 860

Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val
885 890 895

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900 905 910

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915 920 925

Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asn Gln Ser
930 935 940

Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp
945 950 955 960

Leu Thr Pro Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His
965 970 975

Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys
980 985 990

Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Thr Glu Gln
995 1000 1005

Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Thr Pro Asn Ile
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Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile Ile			
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Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly Phe			
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Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys Lys			
310	315	320	
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Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala Gly			
355	360	365	
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Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser Ala			
370	375	380	385
ccc aac agc caa gcc cgg agt gag aaa gct ttc cat gac cag cat ttc			1259
Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His Phe			
390	395	400	
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Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn Arg			
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Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn Asn	
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Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys Gly	
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Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu Asn	
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675						680					685						
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Leu	Gly	Ile	Arg	Ser	Ser	Leu	Val	Ile	Leu	Gln	Val	Val	Pro	Phe	Leu		
690						695				700				705			
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Val	Leu	Ser	Val	Gly	Ala	Asp	Asn	Ile	Phe	Ile	Phe	Val	Leu	Glu	Tyr		
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